TMF

December 1990

THE MAC FLYER - For Greater Safety in MAC Air Operations

A C-29 Sortie . . . page 16

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THE MAC FLYER—For Greater Safety in MAC Air Operations

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Gen. Hansford T. Johnson — Commander in Chief
Col. Donald E. Loranger, Jr. — Inspector General
Col. Thomas M. James — Director of Safety

Lt Col. Richard L. Buck — Supervising Editor
Maj. Dale E. Van De Ven — Associate Editor
Maj. Stephen E. Bohr — Associate Editor
Mrs. Francee A. Caldwell — Writer/Editor
Mr. Tommy F. O'Laughlin — Art Director

The MAC Flyer is published by the Director of Safety, Military Airlift Command. The contents are informative and not regulatory or directive. Names of people and places in mishap stories are representative and not necessarily of the aircraft or equipment involved. Information in any article may not be construed as incriminating under Article 31, UCMJ.

Contributions, comments, and criticisms are welcomed. Write: *The MAC Flyer*, HQ MAC/IGFE, Scott AFB, IL 62225-5101. Or call Autovon: 576-3534/5542 or commercial: (618) 256-3534/5542. The editors reserve the right to make editorial changes in manuscripts which they believe will improve the material without altering the author's intended meaning.

Subscriptions are available from: The Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Changes of address for subscription mailing should be sent to the GPO. Give both old and new address, including zip codes. USAF Active and Air Reserve Forces units should establish magazine requirements through the OPR (HQ MAC/IGFE). Other U. S. Military units should consult administrative directives. *The MAC Flyer* is published at an approximate ratio of one magazine for every five MAC crewmembers, and one for every twenty MAC support personnel. Distribution X; OPR: HQ MAC/IGFE ISSN 0024-788X

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INCORRECT MONTH AND ISSUE NUMBER, SHOULD READ DECEMBER, NUMBER 12.

General Johnson's Holiday Message

This is the season to reflect on the past year, make our resolutions for the coming year, and share holiday traditions with our families. For a number of years, it has been a MAC tradition to slow down our operations and "bring the troops home for the holidays." This tradition has, unfortunately, been broken during the past two years.

Last December, just as we were slowing down operations for a holiday break, we suddenly cranked them up to full speed in support of Operation Just Cause. Now, once again, many of you will be away from home and family answering the call to support Desert Shield.

I know how difficult it is to be separated from your families, particularly at this time of the year. I also know that you are aware of the critical role that you, the men and women of Military Airlift Command, are playing in Desert Shield—just like you did last year in Just Cause.

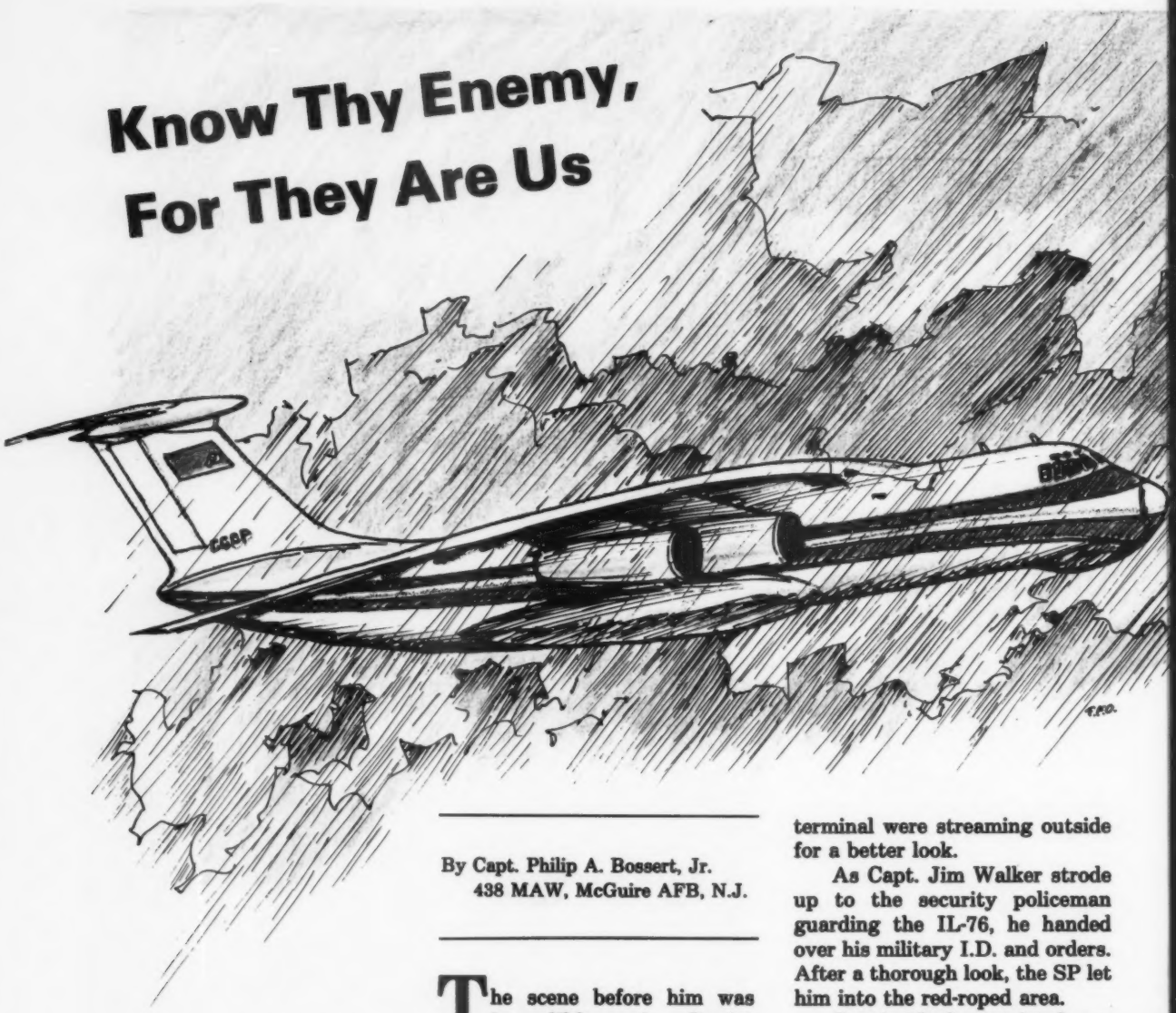
The holiday season is a time of giving, and last December your professionalism and sacrifice helped give our Panamanian friends the greatest gift of all—freedom. This year those same virtues are helping protect the security and sovereignty of our friends on the Arabian Peninsula.

Many of you will spend this holiday season in a demanding and dangerous environment. You will work long hours, under difficult circumstances in a real-world, tactical environment—the type of environment that breeds accidents. Whenever we increase the tempo and push our people and equipment to maximum levels, we must also push to increase our safety awareness. In time of crisis we must all lean forward, but we do not help our command or our country if we lean so far forward that we fall down.

All America is proud of the role you are playing. We appreciate your sacrifice, we admire your professionalism, and we are grateful for your service.

Linda and I wish you all the very best for the new year. Let's work to make it a safe one, and pray that next year we can all be home for the holidays. ✈

Know Thy Enemy, For They Are Us



By Capt. Philip A. Bossert, Jr.
438 MAW, McGuire AFB, N.J.

The scene before him was incredible. A Soviet warplane was sitting on the ramp at Andrews AFB, just a few hundred yards from the hangar where Air Force One and Two were housed. He wasn't the only one shocked by this sight—dozens of people from the passenger terminal were streaming outside for a better look.

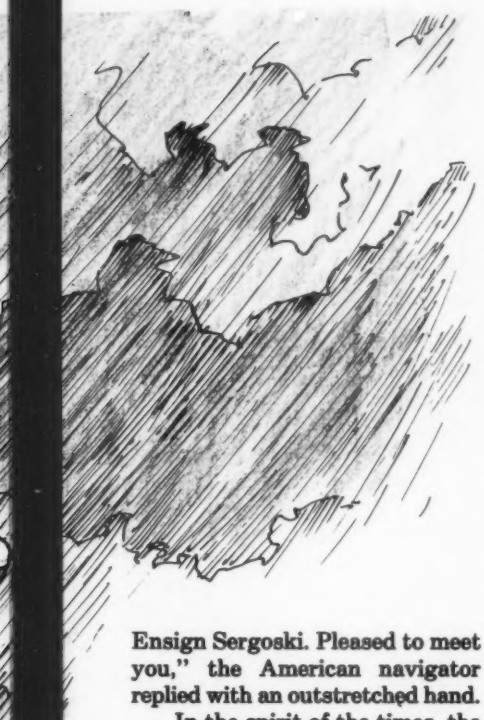
As Capt. Jim Walker strode up to the security policeman guarding the IL-76, he handed over his military I.D. and orders. After a thorough look, the SP let him into the red-roped area.

Just inside the restricted zone stood Second Officer Andrei Sergoski, the copilot of the Soviet transport.

"Captain Walker?" asked Sergoski in a heavily accented voice.

"Yes, I'm Captain Walker,

HONORABLE MENTION
1990 MAC FLIGHT SAFETY WRITING CONTEST



Ensign Sergoski. Pleased to meet you," the American navigator replied with an outstretched hand.

In the spirit of the times, the Russian and American shook hands on the hot ramp, not far from where the President often waved to crowds and the press as he departed on Air Force One. Sergoski led Walker to his jet, which looked like a C-141 with a Soviet flag on the tail.

In a few minutes, the IL-76 with Walker at the navigator's station would depart for Kirtland AFB, N.M., with Soviet and American Intermediate Range Nuclear Forces (INF) verification inspectors on board to monitor the destruction of the last Pershing III missiles. While the mission was one for celebration, marking the successful completion of the first agreement which actually eliminated an entire class of nuclear weapons, their flight to Kirtland would be otherwise.

At 0745, the 374,000-pound Ilyushin IL-76 "Candid" lifted off from Runway 01 Left. The commander, Victor Ogarkow, smoothly turned the Soviet transport left within 1.5 miles of the base to avoid overflying Washington, D.C., and headed west toward Kirtland and a date with near disaster.

Unknown to the IL-76 crew and Captain Walker, an area of moist air was beginning to coalesce over McAlester, Okla., about three hours away and directly in their flight path. Like most nascent thunderstorms, this prospective level-four storm was forming under ideal circumstances with tons of unstable air, plenty of moisture, and lots of lifting action.

As the "Soviet C-141," as some intelligence officers dubbed the II-76, leveled off at FL 350, 33 minutes after departure, Ogarkov engaged the autopilot and called for the en route checklist. When this was completed, the cockpit crew settled down. From his seat in the navigator's station, Walker had an excellent vantage point for giving the IL-76 a good look. The intel boys at Andrews had promised to buy him several rounds at the club in return for his information and he wasn't going to let them down.

The Candid-A was an impressive plane, even by western standards. Unlike the Candid-B which carried two 23mm MR-23 guns in the rear turret and pods of 96 50mm IRCM flares, the Candid A was designed for more peaceful missions, such as trips to Antarctica and diplomatic forays. First fully operational in July 1983, it could carry 88,185 pounds of cargo 2,700 miles and cruise at 405-432 knots. Basically, it was a slightly updated version of the Lockheed C-141 Starlifter with leading ledge slats and navigator windows in the lower nose. The IL-76s replaced the AN-12 and were now the mainstay of the Soviet Military Transport Aviation Force (VTA), the Soviet version of MAC.

Good old Soviet ingenuity at work again, thought Walker with a big smile as he noted the similarities between the IL-76 and C-141.

As the first hour of the mission drew to a close, the uncomfortable silence in the cockpit began to become unbearable. Everyone was concentrating on doing their jobs, and even with the easing of the cold war, there appeared to be an uneasiness on board.

"Glasnost is definitely absent in this plane today," murmured Jim Walker to himself.

The flight engineer, Sergeant First Major Petr Georgyevich, overheard Walker's comments and said in a friendly voice, "Commander, Glasnot is everywhere in this aircraft. Just our very mission in your country is an example of our openness."

A startled Walker replied, "That might be true, Sergeant First Major, but why is everyone so quiet here?"

Commander Ogarkov shot back over the intercom, "Okay, Captain Walker, what would you like to talk about? How war-like we are in the Soviet Union, about the camps in Siberia, how empty our grocery stores are, or other facts your press likes to publicize about us?"

Sensing he was heading for trouble, Walker figured he better say something to break the ice.

"How about Soviet women?" querried the cautious American navigator.

Copilot Sergoski replied, "Like in the Wendy's commercials?"

Suddenly, the cockpit erupted in laughter as the ice (Siberian style) was suddenly broken and a very uncomfortable situation cleverly avoided.

The conversation continued to lighten up as they talked about their careers, family life, and of course flying. The Soviets wanted

to know about the massive U.S. problems with drugs, AIDS, and the homeless, while Walker asked how bad alcoholism, shortage of consumer goods, and ethnic unrest were. Funny how every country had its problems!

Walker learned the reason there wasn't a pilot retention problem in the VTA. All Soviet officers, whether they flew or not, incurred a thirty-year commitment. "Hopefully, the U.S. Congress wouldn't get any ideas," mulled the American navigator.

But while things were looking up in their cockpit, things were going to hell in a hand basket over McAlester, Okla., now only 45 minutes away. Huge towers of cumulonimbus clouds were erupting at over 3,000 feet per minute, forming a north-south wall over 75 miles long in a classic squall line. Tops would be peaking at 47,000 feet shortly. The horrific power of nature was being unleashed in all its fury in this satanic-like creation, as thousands of tons of moist air billowed skyward. Every hazard known to man exists in thunderstorms, including strong winds, severe turbulence, wind shear, lightning, heavy rain showers, severe icing, hail, and tornadoes. While this monster, quickly developing over McAlester, wouldn't have all these, it would have enough to teach Walker and the crew of the IL-76 a lesson they would never, ever forget. Just as the cockpit conversation was becoming livelier, the light heartedness was suddenly broken with an announcement from Kansas City Center.

"Attention all aircraft, convective SIGMET 2-Bravo. From 40nm east of Tulsa, Okla., to 70nm north of McAlester, Okla., to 25nm west of Will Rogers, to 30nm south of Ardmore, a line of severe thunderstorms tops over FL 450. Hail, lightning, and strong winds possible."

After the copilot located the area on his chart, he quickly pointed out to the commander, "Sir, it's right in our flight path."

"Suddenly to his horror, a fiery flash of light illuminated the cockpit, briefly blinding him. . . ."

Ogarkov shot back, "We'll get a little closer and see if we can pick our way through."

This brief exchange caught Walker's attention and he added, "Commander, you are authorized to deviate as necessary. There are no prohibited or restricted areas near that convective SIGMET."

"Thank you, Captain, I know. We got the same briefing on en route procedures at Andrews."

Well, pardon the hell out of me, thought Walker. His initial impression of the commander was confirmed. Ogarkov was a classic hardheaded aircraft commander, reluctant to listen to anyone but himself. He had seen his American counterpart several times in the past—those know-it-alls who thought cockpit resource management and mission oriented simulator training were an infringement upon the authority of the AC. Ogarkov would pay a painful price for his arrogance.

Twenty minutes after they received the Kansas City SIGMET, the IL-76 Tashkent color weather radar began picking up strong, bold red cells at the 150nm range. Adjusting the tilt for a more accurate return revealed a squall line with a small opening.

Walker had a Tashkent at his station also, and what he saw sent shivers up his spine. He just hoped Ogarkov wouldn't attempt to pass through that small break.

They still had a few minutes until they reached the opening, and Walker wondered if the Soviets had similar thunderstorm avoidance criteria. Looking through the IL-76 flight manual the engineer had loaned him, Walker noticed it looked similar to the C-141 Dash One except for an additional section entitled, "Communism and Flight Operations." Using the little Russian he knew, the American navigator opened to Section Eight and saw on page one a picture of two Soviet pilots, a Soviet flag and an IL-76 in the background with the words, "Pilots of the world unite."

Looks like they might have a pilot's union over there, thought Walker with a smile.

Before he could look to the adverse weather section, the plane was jolted by severe turbulence throwing articles around the cockpit, including the flight manual.

As he tightened his seat belt and shoulder harness, Walker was stunned by the scene outside. They were entering the small break between the two CBs, but it was rapidly closing in around them, and blackness quickly enveloped their IL-76.

Suddenly, to his horror, a fiery flash of light illuminated the cockpit, briefly blinding him, followed by an eardrum-shattering crash of thunder. Several seconds later, the IL-76 rocked violently as a shaft of convective air swallowed it, shooting it skyward. The altimeter and VVI began gyrating wildly, and Walker's ears began popping as they rocketed upward.

Just about the time he

thought they were about to enter orbit, the jet banked sharply over on its left side and began plunging earthward, 22 degrees nose low. Commander Ogarkov wrestled with the yoke to regain some semblance of control, but as they fell through 47,000 feet with Numbers 2 and 3 engines compressor stalling, the cockpit began rattling with metallic "pings" as fist-sized hail pummeled them. Walker felt as if he were inside a tin can being shot with an automatic "BB" gun.

With the altimeter finally settling at 33,000 feet and the fire storm of hail diminishing, Walker and the now shell-shocked crew began breathing a little easier, assuming they were through the worst. The copilot was thinking how he'd rather fly a low-level over Afghanistan any day than fly again through what they'd just experienced.

Suddenly, another vertical black wall of hell engulfed them. Extreme turbulence began shaking every bolt in the IL-76 and fear grasped every bone of every crewmember. A bluish, liquid-looking light began undulating on the windscreen, and suddenly a bolt of lightning exploded on the radome. The jet was rocked to its core and portions of the electrical system began shorting, as sparks flew from the engineer's circuit breaker panel.

Although he felt they were finished, Walker reached for a fire extinguisher, but as he handed it to the engineer, another burst of extreme turbulence threw Walker's head against his radar set, knocking him out cold. . . . Walker awoke in one of the crew bunks with a splitting headache. Not knowing where he was or how long he'd been out, the badly-shaken navigator's first thought was, I didn't know they had IL-76s in heaven!

After crawling back to his seat and swallowing some aspirin, Walker learned what had happened. About ten minutes after being knocked out, they had finally exited the squall line on the east side and diverted south around the remaining cells.

Just looking around the cockpit gave Walker an idea of the magnitude of the damage. According to engine instruments, Number 4 engine was shut down, probably because of hail damage. The windshield was badly cracked and pockmarked and foam from the fire extinguisher still lay on parts of the circuit breaker panel. The engineer's panel indicated a main AC bus and two DC buses were out of commission, and the left air conditioning pact was shut down.

The cockpit was eerily silent, like the vestibule of a funeral home just prior to a wake. Kirtland was now only 150 miles out, and luckily for them, the weather appeared good—to the obvious relief of Commander Orgakov, now struggling with the yoke. Apparently the severe thunderstorms they had so insanely penetrated had damaged their flight controls, and the approach into Kirtland would test his airmanship to its fullest while at the same time driving home the lessons he had learned.

At 75 miles out, they declared an emergency and requested a chase ship. A C-130 quickly appeared, the only aircraft in the area.

After performing a hasty controllability check, they discovered their flaps were frozen in the retracted position, and to make matters worse, the visual report by the C-130 crew confirmed their worst fears.

"Red 01, this is Gator 462."

Sergoski replied, "Gator 462, this is Red 01. How do we look?"

"Red 01, not good. You are missing about one-third of your left aileron, about 20 percent of your rudder, and the fuselage is heavily peppered with softball-size dents."

With that report, Ogarkov finally realized the magnitude of his arrogance, stupidity, and total disregard for cockpit resource management. He promised himself at that moment to change and, if the VTA didn't take his wings, to educate other pilots about his mistakes.

As they finally rolled out onto the final approach course for Runway 08, Captain Walker, sitting just a few feet behind Orgakov, was thinking deeply too. With a sarcastic yet humbled voice, Walker asked Sergeant First Major Georgyevich, "Hey engineer, do you know what we'll really be celebrating here at Kirtland?"

The Soviet engineer responded quickly, "The successful conclusion of the INF Treaty, of course!"

"No," shot back Walker. "We'll be celebrating being alive!"

Capt. Philip A. Bossert, Jr., a 1982 AF Academy graduate, earned his wings in 1983. A previous AC in the CT-39 and a C-21A instructor pilot, Captain Bossert is a regular participant in the writing contest and a multiple winner.

Conflict at the Green Tank

The "see-and-avoid" aspect of flight operations has been around since the Wright Brothers put their second flying machine in the air, solving the controversy of which brother would fly, and which would follow on the "chase" bicycle with spare parts. Numerous mishaps have been attributed to the failure of aviators to see and avoid. What follows is partially a result of such a breakdown of awareness.

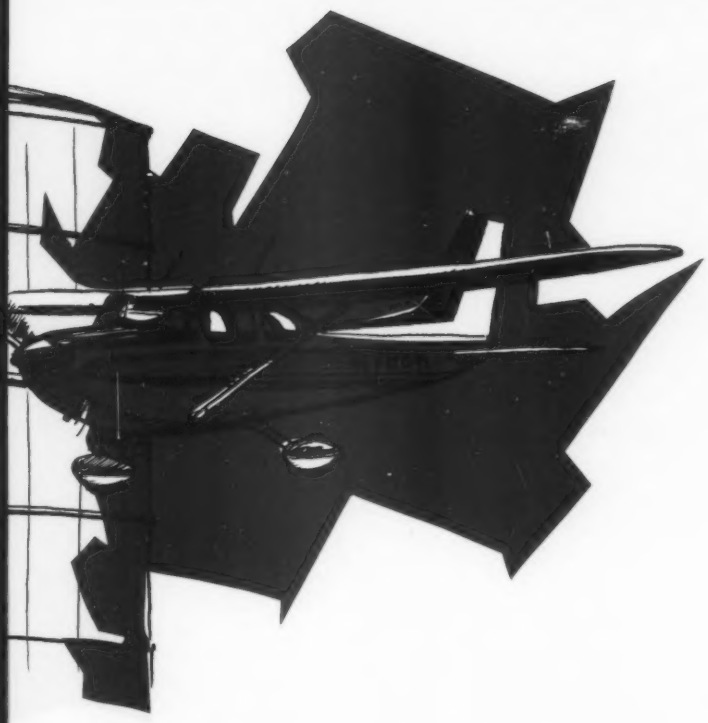
FLIGHT HISTORY

On 31 March 1987, N75584, a Cessna 172, with a flight instructor and a student pilot on board, was en route from Metropolitan Oakland International Airport (OAK), near Oakland, Calif., to the Livermore, Calif., practice area. At 0944:18 Pacific Standard Time, the airplane requested clearance to taxi to OAK's Runway 33. At 0955:32, the Cessna was cleared for takeoff from Runway 33 with a "right turn-out" approved.

At 0954:54, Northstar 1950, N39614, a Piper PA-32RT-300, reported it was nine miles north of the airport with the current Automatic Terminal Information Service (ATIS) information. Oakland ATIS information Bravo stated, in part: ". . . weather, 20 thousand thin broken, visibility 15 . . . visual approach runway two niner, ILS and visual approach Runway 27 right in use, make right traffic Runway 27 right . . . ."

The Piper, with one pilot on board, was on a ferry flight from Marysville, Calif., to OAK to receive cargo. The flight had originated in Sacramento, Calif., about 0400 as a ferry flight to OAK to load cargo. It departed OAK around 0705 en route to Chico, Calif., and to Marysville to offload cargo at each location. Both Cessna and Piper operated under Federal Aviation Regulation (FAR) Part 91, and visual meteorological conditions prevailed.

At 0955:15, the OAK North Tower controller told the Piper to plan on a right entry to Runway 27R. At 0957:33 the Piper reported it was "over the green tank turning downwind." The green tank referred to a large natural gas storage tank that was used as a visual reporting point for OAK north field operations. At 0957:36, the OAK tower controller responded, "Northstar 1950, Oakland Tower, not in sight. Cleared to land Runway 27R, wind 190 degrees at 5." Neither the Piper nor the Cessna were given traffic advisories in their communications with the OAK



tower controller. No further transmissions were received from either flight. The two airplanes collided at about 1,000 feet MSL, about one mile north of the departure end of Runway 33.

Witnesses were generally consistent in describing the movements of the Cessna and the Piper. The two planes reportedly approached each other relatively head-on and struck left wing to left wing. Witnesses said the wing of one airplane appeared to break off. The planes then spun out of control and fell to the ground.

The Cessna fell in a storage facility of the Pacific Gas and Electric Company (PG&E). It caught fire on ground impact and continued to burn. The Piper fell into a shallow portion of the San Leandro Bay, adjacent to the airport. Both airplanes were destroyed and the three occupants of both aircraft were fatally injured. A security guard at the PG&E facility sustained serious injuries from falling debris.

ANALYSIS

The Cessna pilot-in-command had received most of her piloting experience from the Alameda Aero Club based at OAK. According to several officers of the club, she had a long-term interest in aviation. They considered her to be one of the club's best flight instructors, a very goal-oriented individual pursuing a career as an airline pilot. Her personal life was reported as stable and satisfactory. She was a full-time student in aviation management at a nearby college, while earning income and gaining flight experience through her employment with the Alameda Aero Club.

Her total flight hours could not be determined because her pilot log was destroyed in the mishap. However, information on her most recent FAA medical certificate, completed on 2 Sep 86, indicated she had accrued 1,250 flight hours at that time.

The pilot of the Piper began his employment at Northstar on 15 May 86. He received his initial flight training at Embry-Riddle Aeronautical University, Daytona Beach, Fla., studying Aeronautical Science. From Jan 84 to Jul 84, he was a flight instructor in Redding, Calif. From Jul 84 through Jan 86, he was a First Officer on a Cessna Citation for a corporate aviation department. On 17 Oct 86, he unsuccessfully attempted to qualify for 14 CFR 135, authority to operate Northstar's Cessna 402. On 3 Mar 87, he successfully qualified for an FAA Airline Transport Rating certificate. He was qualified to fly the Cessna 210 and the Piper PA-32 at Northstar. At the time of the mishap, he had accrued an estimated 1,825 flight hours, of which about 115 were in the Piper PA-32.

On 6 Nov 85, the pilot of the Piper underwent radial keratotomy surgery on his left eye to correct a myopic condition. On 18 Dec 85, the same procedure was performed on his right eye. Prior to the surgery, his vision had been measured as 20/200 in each eye, corrected to 20/20. Following the surgery, his vision was measured as 20/25 in the right eye and 20/20 in the left eye, both uncorrected. The pilot did not report problems with glare or variable vision after the surgery.

On 7 Jan 86, in his application for a first-class medical certificate, the pilot informed the FAA of the surgery. In the medical examination performed on that date, he successfully demonstrated visual acuity in

"The pilots should have been able to see and avoid each other in time to avoid the mishap."

both eyes without corrective lenses. On 8 Apr 86, he was granted a first-class medical certificate with the proviso that "because of your history of radial keratotomy, operation of the aircraft is prohibited at any time new symptoms or adverse changes occur."

The pilot's most recent medical certificate was granted on 12 Jan 87. His vision was evaluated and, according to the examining physician, he had "normal uncorrected stable vision (that had been) observed for over one year." He was granted a first-class medical certificate with no limitations. According to the examining physician, following surgery the pilot did not report experiencing problems with glare. In fact, the pilot told the physician he experienced less of a problem with glare following the surgery than before when he had been wearing contact lenses.

Radial keratotomy is a surgical procedure designed to improve myoptic vision or nearsightedness. Medical opinion on the risks and benefits of this procedure varies. Potential adverse effects include glare and "drifting" or fluctuating vision as a function of daily changes in intraocular pressure. Patients experiencing drifting can have changes in visual acuity from 20/20 at one time of day to 20/30 and 20/40 at another. Because of its unpredictability, drifting cannot be corrected. In addition, an estimated 10 percent of radial keratotomy patients will return to their original myoptic condition in spite of the procedure.

In Mar 86, at the request of the FAA, The American Medical Association (AMA) completed a review of FAR Part 67 regulations concerning medical certification of airmen. The review was to provide the FAA with a comprehensive examination of medical standards pertaining to airmen. Although the AMA did not recommend changes to the medical standards based on a history of radial keratotomy, in its rationale for changes, the AMA concluded that, "surgical results with radial keratotomy are variable. Stability of postoperative refraction is also variable, especially in the first few months, when night glare and fluctuating vision are significant complaints. Ninety-one percent of individuals who have undergone radial keratotomy would meet the visual acuity standards for a Class One medical certificate. However, approximately one-fourth of these persons have some mild to moderate difficulty with glare, visual fluctuation, and night driving. For this reason, persons who have undergone radial keratotomy should be excluded from obtaining Class One or Class Two FAA medical certificates."

According to the manager of the Occupational Health Division at the FAA's Office of Aviation Medicine, air traffic controllers who have undergone this procedure are denied medical certification. However, according to the office of the Federal Air Surgeon, waivers from this policy were granted to one or two controllers on an individual basis. This policy does not apply to pilots—they are required to demonstrate to their optometrists or opthamologists only that their vision is "stable." The FAA does not provide a definition of stability for the vision of pilots, but it does for controllers. Consequently, standards of visual stability regarding pilots are left to the discretion of the vision specialist performing the examination. Physicians in the U.S. Army and U.S. Air Force informed the Safety Board that pilots in the U.S. military services are not permitted to undergo the surgery and will be permanently withdrawn from flight status if they are discovered to have undergone radial keratotomy.

OAK is owned and operated by the Port of Oakland. Before the mishap, residents of the city of Alameda, located west of the airport, increased their objections to the noise generated by aircraft departing OAK's north runways. In 1983 the airport began monitoring aircraft noise in and around Alameda. Around the same time, the airport developed a noise abatement plan and published a version of it in a one-page handout, sized as an instrument approach chart, which it distributed to local pilots. According to the handout, the procedure called for aircraft departing Runway 33, the runway used for most north field departures from OAK, to "make a 45-degree right turn as soon as possible after takeoff; overfly the center of San Leandro Bay, avoiding the northwest shoreline; fly to the left of the green tank, then establish departure heading."

As a result of increased citizen pressure, signs were posted around and on the airfield which directed a modified noise abatement procedure. This procedure resulted in departing aircraft often overflying the green tank rather than flying to the left or west of it. Neither noise abatement procedure was published in the Airport Facility Directory.

Aircraft inbound to Runways

27R and 27L were unaffected by the "new" procedures. According to OAK local air traffic controllers, arriving aircraft were expected to fly east of the green tank, that is, between the green tank and the Oakland Coliseum, another prominent visual landmark.

Neither noise abatement procedure was submitted to the FAA for approval. On 13 Jan 86, the FAA Administrator issued an order, in part, requiring regional offices to, "review flight procedures proposed for noise abatement purposes for any significant adverse effect . . . ." Following the mishap, the Administrator issued a memorandum to FAA Regional Directors that further clarified policy. The memo stated, in part, ". . . all flight procedures, regardless of whether they are IFR or VFR, are subject to FAA review and approval. Inaction on our part could be interpreted by some as FAA approval or endorsement of the procedure."

FAA policy directs controllers to issue traffic advisories if they perceive a conflict between aircraft. After the mishap, the tower controller told Safety Board investigators he did not provide traffic advisories to the two airplanes because he did not consider the Cessna to be potentially conflicting with the Piper since he thought the Piper was further out than it really was. He believed the Cessna would follow the noise abatement profile until it was established on the northwesterly heading and then would initiate the right turn to the Livermore practice area.

About 20 minutes before the mishap, the north tower Bright Radar Indicator Tower Equipment (BRITE) was taken out of service for routine maintenance and remained out of service until shortly after the mishap. The maintenance was not performed at night, when the tower was closed since, according to tower personnel, this would have required paying overtime wages to the airways facilities technicians who performed the maintenance.

OAK North Tower controllers appeared to differ in the extent of their use of the BRITE. One controller said he used the BRITE for traffic advisories, sequencing, and aircraft identification. Another said he used the BRITE "a lot" for advisories to inbound and outbound traffic. Another said the BRITE is used to verify the location of aircraft, since pilots often "don't know where they are."

Recorded air traffic control radar data from the Oakland Air Route Traffic Control Center indicated the collision occurred about 1,000 feet AGL. Recorded radar information indicated the Piper and the Cessna achieved a closure rate of about 194 knots, based on the Piper's calculated true air speed of 136 knots, the Cessna's true air speed of 81 knots, and the collision angle. Neither aircraft took evasive action, according to both witness reports and radar data.

The Safety Board applied radar data on the flight tracks of the Cessna and the Piper to known data on the visibility from the pilot seats of the two airplanes to determine the approximate time each airplane could have been visible to the pilot of the other. The results indicate that each airplane was within the viewing area of the pilot of the other airplane for at least 20 to 30 seconds before the mishap. The Cessna would have appeared about one degree to the right of the Piper pilot's eye reference point, slightly above the Piper's engine cowl, in the propeller rotation arc. The Piper would similarly have appeared to the Cessna pilot just above the engine cowl of the Cessna.

PROBABLE CAUSE

The Safety Board believed that because of the daytime visual meteorological conditions, the pilots of the Cessna and the Piper should have been able to see and avoid each other in time to avoid the mishap, and their failure to do so was a primary cause of the mishap. However, the Board also believed that several other factors directly or indirectly affected the safe operation of the airplanes. These factors included: noise abatement procedures which reduced separation between arriving and departing aircraft; the absence of BRITE during a period of moderate traffic activity; the failure of the local controller to issue traffic advisories; and the lack of a uniform FAA policy on granting medical certificates to those undergoing radial keratotomy surgery.

APPLICATION TO MAC

First and foremost, the "see and avoid" aspect is but one link in this mishap chain. As with most incidents, had one link in the mishap sequence been removed, it would not have been possible to complete the chain. See and avoid is a link we, as aviators, can control. It is not only professionally prudent, but downright smart. Our very lives can depend on it. Secondly, medical procedure restrictions are there for a reason. We've heard for years that self-medicating is not only unauthorized, but dangerous in some cases. The Piper pilot's eye surgery carries things a bit further, but the lesson is the same. All medical procedures and medications for fliers should be administered under the care and supervision of a flight surgeon.

Adapted from: *NTSB/AAR-87/09*

TMF Instrument Quiz

Localizer Type Directional Aid

1. To fly the final approach course segment of this approach, your aircraft must have:

   a. ILS or TACAN.
   b. Localizer and DME.
   c. VOR and DME.
   d. ILS, ADF, and DME.

2. Vertical guidance for this approach is provided by the ILS glide slope.

   a. True.
   b. False.

3. The LDA course usually provides a more precise approach course than the similar simplified directional facility (SDF) installation.

   a. True.
   b. False.

4. Air traffic control has not cleared you for landing. At JOESS you should:

   a. Fly visually to Runway 30L on a 312 degree heading.
   b. Execute the missed approach.
   c. If VMC, fly visually to Runway 30L.
   d. If IMC, contact Tower for permission to enter the TCA.

5. When flying an instrument approach procedure with a visual segment, obstacle clearance becomes the sole responsibility of the aircrew when the approach is continued beyond the missed approach point.

   a. True.
   b. False.

6. St. Louis Approach Control has directed you to execute the missed approach. What other events require performing a missed approach when the missed approach point or decision height is reached?

   a. The runway environment isn't in sight.
   b. You are unable to make a safe landing.
   c. Both a. and b.
   d. None of the above.

7. Leaving JOESS your "climbing left turn" direct to Foristell (FTZ) makes the aircraft heading 263 degrees. Upon arrival at FTZ:

   a. Aircraft heading is within 70 degrees of the holding course; turn right to parallel the holding course.
   b. Aircraft heading is within 70 degrees of the holding course; turn left to parallel the holding course.
   c. Aircraft heading is not within 70 degrees of the holding course; turn outbound in the shorter direction to parallel the holding course.
   d. Upon reaching the holding fix, turn on the holding side and attempt to intercept the teardrop course outbound.
   e. Either c. or d. is correct.

8. Once established in the holding pattern, if compensating for wind, the minimum bank angle is 15 degrees or one-half standard rate turn, whichever is less.

   a. True.
   b. False.

9. After the first turn in holding you should adjust inbound legs as necessary so as not to exceed the maximum outbound time.

   a. True.
   b. False.

10. The visual segment of the final approach crosses the extended runway centerline at about a 12-degree angle for this approach. To be a straight-in approach the angle between the final approach course and the extended runway centerline shall not exceed _____ degrees.

a. 20 degrees.
b. 25 degrees.
c. 28 degrees.
d. 30 degrees.

11. Which runway threshold and approach lights will most likely be seen first when flying this approach to minimums?

a. Runway 30L.
b. Runway 30R.
c. Runway 31.
d. Runway 35.

12. Runway 30L length is:

a. 10,819 feet.
b. 10,562 feet.
c. 11,019 feet.
d. 9,003 feet.

13. Runway 30L has high intensity runway lights, touchdown zone lighting, and centerline lights.

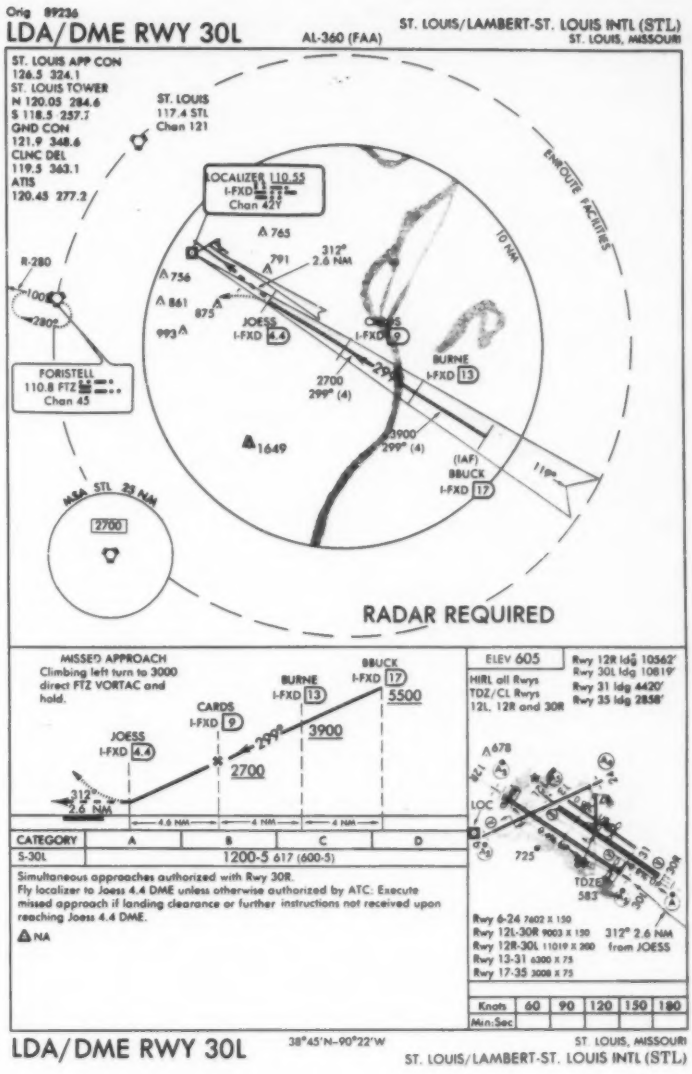
a. True.
b. False.

14. When computing landing data for Runway 30R be sure to include the:

a. 0.8 percent upslope.
b. 0.4 percent downslope.
c. 0.9 percent downslope.
d. 0.8 percent downslope.

15. Runway 30L has a displaced threshold marked with arrows pointing to a white stripe prior to the threshold marks. The area with the arrows can not be used for:

a. Taxiing.
b. Takeoff.
c. Hover taxiing.
d. Landing.



16. On Runway 30L with the runway lights on, the last 2,000 feet of runway lights will be _____ colored and the last 1,000 feet of centerline lights will be _____.

a. Yellow/amber, and alternating red and white.
b. Alternating white and yellow, and all red.
c. Yellow/amber, and all red.
d. Alternating yellow and red, and all red.

THE ANSWERS

1. b. Localizer and DME. Straight-in approaches are identified by the types of navigation aids which provide final approach guidance and the runway to which the final approach courses are aligned. A slash (/) indicates that more than one type of equipment may be required to execute the final approach (LDA/DME). Be aware that additional equipment may be required to execute the other portions of the procedure. (AFM 51-37, para. 7-6a(3)(a).)

2. b. False. On a Localizer Type Directional Aid (LDA) there is no glide slope. The approach procedure provides minimum altitudes.

3. a. True. The LDA course usually provides a more precise approach course than a SDF, which may have a course width of 6 degrees or 12 degrees. (AFM 51-37, para. 5-9.)

4. b. Execute the missed approach as explained below the minimums block of the approach plate.

5. a. True. Obstacle clearance becomes the sole responsiblity of the aircrew when the approach is continued beyond the missed approach point. (AFM 51-37, para. 13-5b.)

6. c. Both a. and b. Perform the missed approach when the missed approach point or decision height is reached and if:

1. Runway environment is not in sight (runway threshold or approved lighting aids or other markings identifiable with the runway).
2. You are unable to make a safe landing.
3. You are so directed by the controlling agency.

(AFM 51-37, para. 15-2a.)

7. e. Either c. or d. Aircraft heading is not within 70 degrees of the holding course (100 degrees) so either turn outbound in the shorter direction to parallel the holding course, or intercept the teardrop course outbound if conveniently aligned. Since aircraft heading is 263 degrees and the teardrop course is 235 degrees (using the maximum 45-degrees), the teardrop would be my choice. (AFM 51-37, para. 9-5a.)

8. a. True. When making adjusting turns in a holding pattern, the angle of bank should not be steepened to more than 30 degrees or shallowed to less than 15 degrees or half standard rate, whichever requires the least angle of bank. (AFM 51-37, para. 9.7.)

9. b. False. On the initial outbound leg, do not exceed the appropriate time for the altitude unless compensating for a known wind. Adjust subsequent outbound legs as necessary so as not to exceed the maximum inbound time. (AFM 51-37, para. 9-5b.)

10. d. 30 degrees. The angle of convergence of the final approach course and the extended runway centerline shall not exceed 30 degrees. The final approach course should be aligned to intersect the runway centerline at the runway threshold. However, when an operational advantage can be achieved, the point of intersection may be established as much as 5,200 feet from the runway threshold. (Terminal Instrument Procedures, AFM 55-9, para. 513a(1)(a).)

11. b. Runway 30R is equipped with ALSF-2 lights, which are high intensity and closer to the missed approach point when compared to the medium intensity (MALSR) lights of Runway 30L. (Aerodrome Sketch)

12. c. 11,019 feet. Answers a. and b. are the landing distance available for Runway 30L/12R. (Aerodrome Sketch)

13. b. False. Runway 30L is the only primary runway at Lambert without touchdown zone lights. (Aerodrome Sketch)

14. d. 0.8 percent downslope for Runway 30R. (Aerodrome Sketch)

15. d. Landing. The displaced threshold can be used for taxiing or takeoff and is marked with arrows pointing to the runway threshold. It is not useable for landing; a displaced threshold adjusts the glide path/clear area to account for obstacles or operational requirements. (AFM 51-37, para. 14-5f(2).)

16. c. Yellow/amber and all red. The last 2,000 feet, rollout end of runway, has yellow/amber lights. Centerline lights alternate red and white for 2,000 feet before changing to all red the final 1,000 feet of rollout. Airfields without runway distance remaining markers use runway edge lighting to indicate distance remaining. (AFM 51-37, Fig. 14-5 and para. 14-4.)

Flying-Hour Milestones

10,000

7 MAS
SMSgt. Curtis J. Ocenasek

68 MAS
Lt. Col. Howard D. Berkley, III.

7,500

337 MAS
Lt. Col. James P. Gallin
SMSgt. John M. Missale

349 MAW
MSgt. John R. Buckingham

433 MAW
Lt. Col. Ronald M. Bandsuch
MSgt. Larry D. Hooker

440 TAW
TAW MSgt. Dick Brue

927 TAG
Maj. Michael A. Niziol

5,000

14 MAS
Lt. Col. Kenneth B. Smith
MSgt. Peter E. Dellner
MSgt. Mark J. Murray

183 MAS
Lt. Col. William J. Lutz
Maj. Charles D. Brooks
Maj. Hugh W. Stevens

349 MAW
Maj. Wayne E. Marotz
MSgt. Gerardo L. Villagomez

403 TAW
Lt. Col. Carl R. Cucully
Maj. William P. Sims
Maj. Stephen L. Smith

433 MAW
Lt. Col. Charles L. Atwood
Lt. Col. David H. Comstock
Lt. Col. Theo R. Diltz
Lt. Col. Harland S. Hanson
Lt. Col. Gary W. Spence
Maj. Henry R. Skillern
MSgt. Alberto Campos
MSgt. Simon V. Perez

440 TAW
Lt. Col. Jerome C. Kinder
Lt. Col. Richard E. Spieler

927 TAG
Capt. Kenneth H. Landree, Jr.
MSgt. Larry W. Wyland

939 ARW
Col Pinar Crane
Lt. Col. Lawrence C. Huffman
Maj. James E. Holloway
Maj. John W. Keyes
MSgt. Roger D. Gill

2,500

14 MAS
Capt. James D. Dineen
Capt. John B. Clark
Capt. Robert V. Parthenais
SSgt. Trevor D. Edwards
SSgt. Gerald W. Kadolph
SSgt. Richard E. Morrow

68 MAS
Col. Judith F. Hanson
Lt. Col. Judith A. Keeton
MSgt. Robert C. Bradberry
MSgt. Milta E. Mahoney

76 MAS
Capt. David M. Diamond

183 MAS
Maj. Thomas N. Sledge
Capt. Michael J. Connery
Capt. Richard E. Hess
Capt. John S. Turnage
SMSgt. Patrick R. Kelley
MSgt. Kenneth L. Barnes

312 MAS
MSgt. John C. Davis
MSgt. Dean R. Hibsch
MSgt. Donald B. Sharp
MSgt. Walter G. Witkowski
TSgt. Cary W. Carman
TSgt. Jody W. Chalich
TSgt. William M. Gomez
SSgt. Salvador Prado, Jr.

337 MAS
Capt. James M. Harris
Capt. Ryan C. Rickerby
TSgt. William A. Carroll
TSgt. Larry M. Wells

403 TAW
Maj. Errol J. Perez
1st. Lt. Jack H. Pittman
MSgt. Roy M. CLoud
MSgt. Zack W. Lee
MSgt. Leland L. Rasmussen
MSgt. Cloud M. Roy
TSgt. Lawrence E. Loeding
SSgt. Steven J. Debree

927 TAG
Capt. Jeffery M. Brown
Capt. James P. Foshee
TSgt. Gregory A. Ringel
SSgt. Charles E. Disbennett

939 ARW
Col. William E. Hewes
Lt. Col. Glenn P. Albert
Lt. Col. Paul R. Davis
Lt. Col. Michael W. Everitt
Lt. Col. Gene E. Garton
Lt. Col. Clinton W. Hyde
Lt. Col. Robert F. Januzzi
Lt. Col. Waldo F. Libby
Lt. Col. Dean W. Mills
Lt. Col. Frederick M. Robinson
Lt. Col. Frederick E. Stovel
Lt. Col. Robert J. Weed
Maj. Richard R. Aman
Maj. Stephan J. Barry
Maj. David I. Beck
Maj. Scott A. Borden
Maj. Lewis J. Budge
Maj. Scott M. Christiansen
Maj. John W. Grant
Maj. John M. Heimstra
Maj. Edward L. Horne
Maj. Charles P. Jones
Maj. Kindall F. Jones
Maj. John L. Kaseburg
Maj. Gregory H. Kuh
Maj. Daniel C. McGinley
Maj. William J. Moore
Maj. George J. Pierce
Maj. Ronald Slyter
Maj. Gregory Stankie
Maj. Michael J. Straup
Capt. Gordon Elwell
Capt. Paul D. Emmert
Capt. Thomas D. Humphries
Capt. Roger B. Phillips
Capt. Scott K. Wakefield
Capt. Jeffery C. Wright
SMSgt. Robert J. Tithens
MSgt. Steven Dam
MSgt. Lawrence L. Morris
MSgt. Roger L. Rau
MSgt. Ronald Rucker
MSgt. David M. Stevens
TSgt. Henry M. Gaunt

1,000

Det 9, 37 ARS
Maj. Larry R. Kline
Capt. Thomas W. Greeley

Det 10, 37 ARS
1st. Lt. William G. Saric

Ranks and units are those at time of award.

C-29—Flight Check Incorporated

Left to right: MSgt. Kenneth E. Coxwell, SSgt. Brian A. Kunz, MSgt. Timothy C. Banks, Capt. Richard S. Rose, Capt. Glenn G. Rousseau, and Capt. David A. Guth.

Postflight debrief establishing the "lessons learned."

By Maj. Dale Van De Ven
Associate Editor

"A lot of people don't know what we do. Many people take navigational aids for granted. It's comforting to know what goes on beforehand. Before a pilot and a generic airplane flies an approach to an airport, the approach has been certified by an airplane that flies the outer limits, the lower boundaries next to the trees, to make sure they have a useful signal telling them when to get out of an unsafe situation."

It was with these words that Capt. Glenn G. Rousseau, IP, 1467th Facility Checking Squadron, Scott AFB, began his explanation of just what the flight check guys in the C-29 do. I showed up early that morning for an orientation ride with the 1467th but had to admit I wasn't exactly certain what they did for a living, much less how they went about doing it. Captain Rousseau continued.

"We're doing just what our patch says: 'For Safer Skies.' We're making sure the navigational aids pilots use, be it solo students in Cessnas or experienced military pilots, are of a usable quality and the information given is correct and will keep them clear of hazardous areas and obstacles."

Captain Rousseau's explanation made sense. In my experience most crewmembers (other than nervous navigators coasting in after long overwater flights) do take navigational aids for granted. They're one of the things in this world you simply expect to be there and to work—like the telephone. So, how many people does it take to make this magic happen?

"A crew consists of the aircraft commander, who has to be fully qualified in all aspects, (the mission and the airplane) and a copilot, who is only required to know how to fly the airplane. The inexperienced guy sits in the left

seat and actually flies the airplane. If the aircraft commander tells him to be on the 250-degree radial at 20 miles, established inbound at 2,000 feet, he expects the copilot to put the aircraft precisely there since that's where they need to be to measure the signal for a certain check. With the more experienced copilots, all you have to say is 'set up for a certain check on this radial' and the guy goes to the proper altitute and distance and flies inbound.

"We have a flight mechanic who does preflights, postflights, and all maintenance actions on the airplane. If the plane breaks, he or she is responsible for finding what needs to be fixed, ordering it, getting it delivered, and putting it back on the airplane. There are some limitations in what the flight mechanics can do given the constraints of contract maintenance.

"We also carry two Flight Inspection Technicians (FITs). With them, our basic crew consists of two pilots, one flight mechanic, and two FITs. We can do some inspections with just two pilots, but normally we carry a five-man crew."

Now that we know how many people it takes to do a flight inspection, let's look at where the inspections are done.

"We go TDY a lot. My first year here," continued Captain Rousseau, "I was gone somewhere between 200 and 250 days. My TDYs have been to virtually every Air Force base, and most of the Army and Marine Fields. We do some civilian facilities now and then, but they're the exception to the rule. That's FAA territory. The TDYs range from an out-and-back, to the average trip lasting no longer than five days. We have some missions that go out for a couple of weeks but on the average it's three to five days. I've also done flight checks in Greenland, Honduras, Japan, and the Philippines. On the average, I'd say our IPs are getting 60 hours a month and the line guys between 40 and 50."

The copilot on today's flight, Capt. David A. Guth, is a relatively recent arrival from the world of C-141s. At the first opportunity, I asked him to compare the two worlds.

"This unit is a lot smaller and there is more camaraderie. It's nice to be able to fly a new airplane (the C-29 on today's flight had less than 200 total hours) with all the gadgets and all the state-of-the-art flight instrumentation.

"When we go to work, instead of command post telling us what to do, we simply report back what we've accomplished and what remains to be done. In that respect, the aircraft commander is running the show, which is really a plus. It's enjoyable that way.

"We're worldwide deployable; not just one side of the globe. We don't always go to the standard MAC bases because of fuel. We get more performance out of Jet-A than we do from JP-4. The folks that come here right out of pilot training get a lot of experience and our copilots really grow up fast.

"The mission we do is rewarding. We are the authority to say if this navigational aid is safe to put on the air for other people or not."

When we got to the aircraft, the flight mechanic had things ready to go. I wondered how his job changed when the unit switched from C-140s to C-29s. SSgt. Brian A. Knuz was able to provide the answers.

"The flight mechanic's job definitely changed when we converted airplanes. In the C-140s, we were primary crewmembers

Capt. David A. Guth (left) and Capt. Richard S. Rose loading the INS.

The Flight Inspection Technician team.

Captain Rousseau with contract maintenance.

SSgt. Brian A. Kunz conducting a preflight inspection.

sitting in a jump seat. Now, we don't have any specific in-flight duties. The responsibility of the flight mechanic has been reduced, but we still do many of the same things we did before. We're not rated engineers but we do many of the same things. We take care of TOLD data, preflight and post-flight, take care of forms, and compute weight and balance.

"We're usually in the squadron two and a half hours prior to takeoff to get our toolboxes and pubs, check with command post, and make sure everything is good as far as the schedule and fuel load are concerned. Next, we touch base with the contractor to make sure he has the airplane uncovered and warmed up. Then we go to the aircraft and do the preflight. We have pretty good rapport with the contractor. A couple of the mechanics are former flight mechanics from our section. They perform maintenance when the airplanes are at home station. Once we take the airplane, we're responsible for fixing it until we come back."

It didn't take long after take-off to realize the C-29 is a nice aircraft. It's comfortable, quiet, and equipped with a restroom and a small galley. It was also fully capable of handling the small amount of turbulence we encountered on our low level route in the mountains of northern Arkansas. By the time we reached our destination, a small TACAN set up for a "combat eval" by CCT folks near Fort Chaffee, I was thoroughly impressed with the aircraft. Now that we were near our target, the FITs were in full swing. Later, MSgt. Tim C. Banks, the FIT working the panel, was able to give me some insight into his job.

"The FIT operates various electronic equipment and analyzes the radio signals to make sure they meet certain tolerances. In the C-140, everything was in a manual mode. That meant the aircraft's position was determined by a crewmember on the ground using a device called a theodolite. It's a surveyor's instrument that goes down to the hundreds of a degree. He sights through it like a telescope and tracks the aircraft, sending a radio signal that would give us the aircraft's position at any given time. The new plane is completely automated and uses a computer, INS, and a process called DME multi-lateration, where it triangulates our position. We still try to carry two FITs so if something goes wrong we can put one on the ground with the theodolite. The new plane also has a laser altimeter which really helps us narrow down our position during ILS inspections.

"The amount of time it takes us to check out a facility depends on the type of inspection we're doing. A wartime inspection can take five or ten minutes—just one run in and out—compared to a commissioning inspection that can take several days. When we do a commissioning inspection we have to fly every procedure and define 'coverage,' where we can and cannot pick up the station. We have to do that completely around the facility and out to the limits which may be 25 to 40 miles.

"It's a real unique job, I think it's the best enlisted job in the Air Force. During the actual mission we're just as important as the guy flying the plane because, if we're not back there, if we're not capable, we can't do the job and a lot of money is wasted flying around. We have a lot of pride in what we do."

From what I could see, the entire unit has a lot of pride in what they do, and well they should. They exist to provide a safer environment for the rest of us. Just like the patch says "For Safer Skies."

'TIS THE SEASON TO BE JOLLY!

Have you missed our prize-winning contest announcement in the October and November *TMFs*? Don't worry, you have plenty of time to enter this "Season's" MAC Flight Safety Writing Contest. Be careful though, the contest ends 31 March 1991.

You may not "take pen to hand" as often as we do but lurking in those dark corners of your memory or imagination is a flying experience worth sharing. In case you think you might have trouble putting those memories into the written word, here are a few tips (mentioned before) to help you along the way.

—Tell what happened in a chronological way.
—Relate the cause, effect and solution.
—Use your imagination and write a fictional account based on an actual experience.
—Poetry is another form of creative writing. Poems with recognizable rhyme fare better than "free verse." Modern songs or the great poets' works may be good sources for your format.

These are a few of the many tips we could pass on but we hope they will help get you started. The best stories are technically accurate as well. In addition to these tips, follow the rules below.

HAPPY HOLIDAYS!

THE RULES

The 1991 MAC Flight Safety Writing Contest is conducted according to MACR 900-3 and these rules. Entries must be original, unpublished, contain an aviation safety/mishap prevention message, and be postmarked no later than 31 March 1991. Stories must be between approximately 1,000 and 3,000 words long (about 6 to 14 double-spaced types pages). Poetry should average 75 to 100 lines. Manuscripts must be typed, double-spaced, and submitted in two copies. Identify entries by title only and attach a cover sheet indicating author's name, address, duty phone, unit, and home address. Please include a brief biography.

The contest is open to all. Entries qualifying under the above rules earn their author a complimentary one-year subscription to *TMF*. However, desk sets and plaques may only be awarded to military members and civilian employees of the Department of the Air Force and Air Reserve Components. Other entries may be selected for Honorable Mention Special Category.

Winning entries will be published in *TMF*.
Submit to:

MAC Flight Safety Writing Contest, 1991
HQ MAC/IGFE
Scott AFB, Illinois 62225-5101

THE MISHAP

By Maj. Brenda J. Lindsay
USAF Hospital Dover, Dover AFB, Del.

I'm not an aircrew member; I'm an aircrew member's wife, and I just read about a mishap and the aircrew lost their lives.

My heart went out to their loved ones in my Air Force family, and I wondered just what happened to cause such a tragedy.

The newspaper wasn't specific as to why the mishap occurred, the cause was just attributed to an avoidable aircrew error.

The squadron they belonged to always emphasized safety habits, and all of them were well-trained crewmen with many flying hours to their credit.

They were always conscientious, none of them were reckless kinds, so perhaps they were preoccupied with other things on their minds.

The aircraft commander loved flying, he'd been flying the line now for years, and he never regretted a moment; he loved his Air Force career.

An experienced pilot, well-respected and admired, but he had over twenty, it was time he retired.

They wanted a change now, the kids were all grown, they both were still young, they'd enjoy time alone.

They discussed it at length and the time was just right, with no more TDYs this was his last scheduled flight

He was thinking of fishing and the good times to come, and of the beautiful view from his new mountain home.

The copilot's passion was flying, the ultimate A-number-one.

There was no other job where he knew he could work and be paid for just having fun.

But today was a little bit different, home was where he wanted to be, for they'd just found out the day before, they'd soon be a family of three.

They'd been happily married two years now and things seemed to get better each day, but it scared him to think of the changes ahead with a baby now on the way.

He'd never felt so much emotion, his feelings were hard to contain, but he was strong and confident; composure he had to maintain.

It seemed like only yesterday his life was so worry-free, and he wondered how well he would handle the increased responsibility.

The nav couldn't wait for the takeoff, he'd waited so long for this flight, he didn't get much chance to fly anymore, and to him it just didn't seem right.

With the INS in the cockpit, a machine took his place in the air, only once-in-awhile was he needed; his times to fly now were rare.

He was once a full-time crewmember, he had pride in his skills there's no doubt.

Well the pride was still there but it wasn't the same, he felt just a little left out.

He thought of how much he loved flying and his sadness he tried to ignore, he didn't mind doing the desk job he had, it's just that he loved flying more.

He was thinking of how much his duties had changed since he first started flying the line, and he missed all the flying he once used to do and he wished it could be like old times.

The flight engineer had been doing this job, it seemed, nearly all of his life, but his mind wasn't on this mission today, he was worried about his wife.

The kids were both sick with a fever; why was it always both at the same time?

And he hated the thought of leaving today, even though she said things would be fine.

He knew her life couldn't be easy, but not once had she ever complained; she'd put up with moving and trips and the like, and her humor she'd always retained.

Yes, it seemed that the worst always happened at home everytime he was away, and it never managed to take very long, he only had to be out for one day.

But the kids seemed so sick and he wondered, if this time she would be alright, and he wished he had talked to his scheduler and arranged not to be on this flight.

The loadmaster's mind was on finals and courses she'd yet to complete.

She knew she would have to do well in this class in order to compete for the award of a grant that would let her finish her Bachelor's Degree, but she knew her grades had to be perfect to become this year's nominee.

She'd been taking classes off duty and studied in all her spare time, and the pressure was on and she worried that missing a lecture would put her behind.

But her mind remained fixed on those finals and it seemed it was all on-the-line, and she felt she needed to study and worried she wouldn't have time.

They might have avoided this mishap, by discussing the thoughts on their minds.

By talking to one of their bosses on preflight, they might have left their worries behind.

Perhaps if they'd talked to each other in the premission brief on the ground, they would have looked out for each other and come home safe and sound.

But the crew was concentrating on thoughts of various kinds and the mission just wasn't foremost in any of their minds.

The crew's minds must be on the mission, concentrating is the key, without it a crew is on borrowed time, despite their ability.

Sometimes it is so hard to notice when your thoughts start to deviate and a mishap can just take a moment and before you know, it's too late.

So before you depart on a mission, keep one thing in mind as you go: If you can't keep your mind on your duties, be sure you let someone know.

PUTTING IT ALL TOGETHER

By CW4 Nesbitt L. Mathis

Teaching a new aviator to regurgitate aviation-related information is fine for passing a standardization ride. But in a real in-flight emergency, wishing he were on the ground will not solve his problem. Not only does an aviator have to be able to recall what he has learned about meteorology, aerodynamics, physics, aircraft systems, operating limits, and operating rules, he has to fully understand what he was taught and apply it to the situation at hand. Unless he can do this and do it right, sooner or later something may happen that is beyond his ability to cope, and the result may be another mishap.

I once investigated an incident in which a UH-60 Black Hawk was quite literally flown into the ground after one of its engines failed. This helicopter crashed despite the fact the remaining engine was entirely capable of sustaining the aircraft until it could safely land.

The problem was the pilot didn't understand the information on his performance planning card (PPC). In flight school, he had been thoroughly taught how to compute the numbers to fill the spaces on the PPC. What he apparently didn't grasp was the meaning of the numbers and how they were applied to maintaining controlled flight.

In a flight school setting, where he knew a simulated engine failure was going to occur, he could recite all the required steps and comply with them without exception. What he lacked was a clear understanding of how all the interrelated variables of airspeed, temperature, altitude, aircraft weight, and engine performance work together to ensure continued safe flight under real emergency conditions.

When the engine quit, the pilot didn't attempt a restart, even though his fuel gauge showed he had more than 500 pounds of fuel. Actually, an engine restart wasn't even necessary; he could have maintained flight with the remaining engine for the one to two minutes needed to reach the airfield.

If, however, the pilot assumed the engine quit because the aircraft was low on fuel, trying to make a high-speed dash for the airfield was certainly the wrong thing to do. If fuel status was in question, the pilot should have known that his best airspeed was at least 50 knots less than the high-speed, excessive-power-requirement dash for the landing area he attempted.

In order to maintain continued flight after the Number 1 engine failed, the pilot would have had to reduce airspeed, weight, or power requested, or increase available lift. With no weight to throw out and no means of increasing available lift without restarting the engine, his remaining options were to reduce airspeed and power requested, but that's not what he did.

When the Number 1 engine stopped producing power, the pilot reacted by increasing pitch in the rotor system and increasing airspeed. This demanded more power from the remaining engine than it was capable of producing. The result was predictable. The Number 2 engine went to its maximum available power production of N1. With even more power being requested by the pilot through the high-pitch setting, the engine could only lose power as it's N1, or power section, attempted to keep the rotor system turning at the requested RPM.

Because it wasn't being driven with sufficient power from the engine to overcome induced drag from the high-pitch setting, the rotor quickly began to convert its stored rotational kinetic energy to lift and power. As a result, the aircraft's rotor began to slow, losing its ability to continue providing lift.

At this point, the pilot still had lift and power reserved in his 1,000 to 1,500 feet of altitude. But he squandered this last reserve of potential kinetic energy by maintaining the high-pitch setting in the rotor system in a vain attempt to reach the airfield as quickly as possible and land.

When rotor rpm dropped below 88 percent, the aircraft's main generators dropped off line, and the master caution panel became a blur of caution and advisory lights. As the pilot continued to increase requested power, the aircraft became a $4 million-plus earth dart on a trajectory determined by the factors of altitude and speed instead of a knowledgeable operator. The pilot, from this point on, could only "pile it" wherever that final trajectory carried him. The result was that the Army lost a new aircraft. Only good fortune prevented the loss of the four people on board.

All this happened because a pilot, with a lack of awareness of his situation, exchanged his altitude for increased airspeed. He was convinced the cause of the crash was the failure of the Number 2 engine to produce the power required to maintain flight. In reality, it was his own lack of understanding of the engine—power required for flight versus power available—and the direct relationship between the aircraft's attitude, blade pitch, airspeed, and altitude. He did not analyze his aircraft instrument indications nor immediately know what his single-engine performance was for his present altitude.

When the chips were down, he couldn't put it all together. He didn't know and, at that point, it was too late to learn.

Understanding what we learn in flight school is the key to survival in the aviation game. Knowledge without understanding and application is worthless.

Adapted From *Flightfax*, Aug 90

C.R. TERROR

The Magical Major on the Christmas Express

"Finally," bellowed C. R. from the depths of the scheduler's office, "we get to put our valuable expertise to good use and get some real, honest-to-goodness Saudi Arabian sand in our flyin' slippers."

The basso profundo of the Haughty Herculean could be heard throughout the squadron. Col. Fang winced and instinctively reached for the top right-hand drawer of his desk which held the economy-sized bottle of anti-acid tablets. "I was afraid it would come to this," he mumbled to himself, "and right during the Holiday Season too. Well, at least he'll be out of our hair for awhile."

Yes, the time had finally arrived for the Miraculous Maurader and his fearless band of elves. Believe it or not, they were the only crew available and were about to begin an arduous journey that could send St. Nick himself scurrying for cover. They were taking the Christmas mail to our beloved troops defending the cause of freedom in the Middle East. C. R. didn't much care for the idea of working on Christmas Eve, but for such a noble cause, it was well worth it.

The Bibulous Buffoon's imagination soared as he visualized the reception he would receive—hundreds of thousands of troops showering him with praise in appreciation for Christmas greetings from loved ones. Not since the Magi presented their humble gifts so long ago would anyone be bestowed with such honor. The Omnipotent One's daydreaming was cut short by the duty officer's tap on the shoulder notifying him of a phone call.

"Major Terror, Sir," croaked a raspy voice on the other end of the line, "that 'special' pallet of cargo you ordered is ready. Just let us know when you want to upload it and we'll bring it out."

"Fabulous, my good man,"

shrieked the Prince of Pilotage. "Sgt. Downs is at the aircraft even as we speak. I know full well how light our precious little parcel is, so tell the loadmaster to simply position it all the way forward so we will have plenty of room for the mail when we pick it up on the East Coast."

With that, the wheels of the Christmas Express were in motion. Preparations went surprisingly well and before long, the MAC Maverick and his crew were winging their way toward the onload base.

Upload, rigging, and inspection of the load for airdrop went equally as well. "Boss, why are we airdropping this stuff if all we're going to do is land on the LZ next to the drop zone when we're done anyhow?" queried Blinky.

"Well, m'boy, it seems we are to play a vital role in demonstrating the mighty capability of our foreign policy," chirped the Silver-Tongued Fox. "Our undaunted display of airdrop perfection will be witnessed by the majority of the Saudi Arabian Royal Family and many of its top military brass. They sure picked the right crew for this one, eh?"

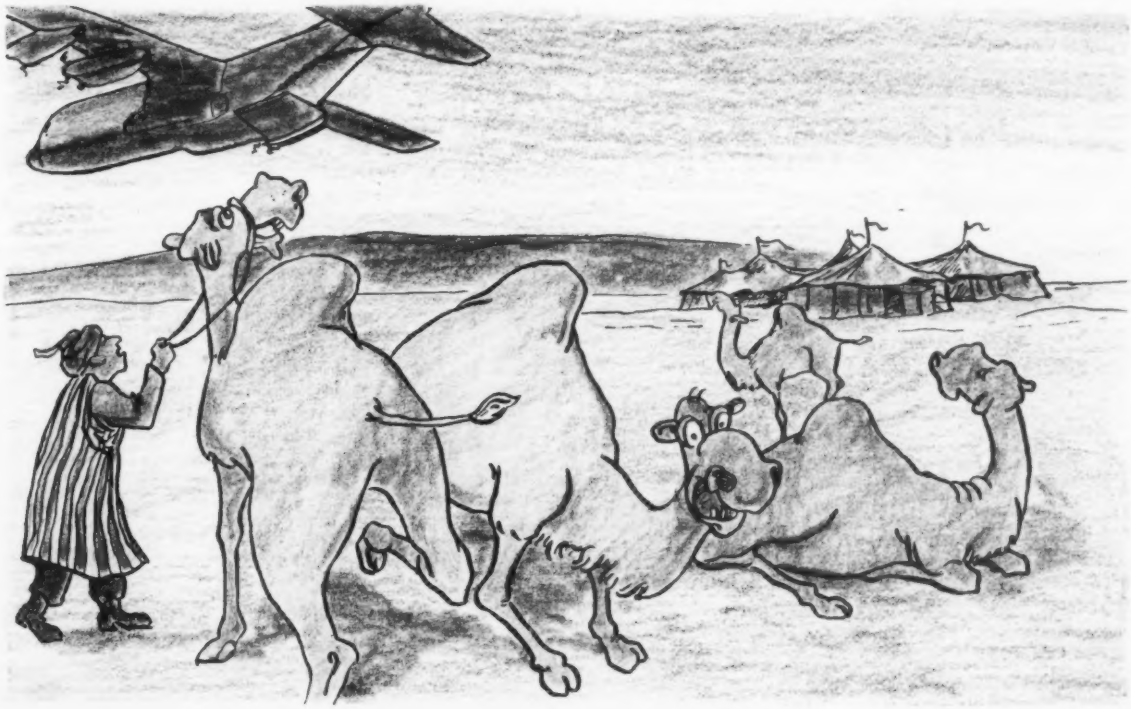
Blinky shrugged and bit his tongue as visions of past C. R. escapades raced through his memory banks.

Before long, the Christmas Express was airborne and headed in an easterly direction. A crew-day extension had been granted, not so much as a result of the crew qualifications, but as dictated by the urgency and importance of the mission. Refueling stops came and went without incident.

Finally airborne from the last stop, C. R. relinquished control to his trusty copilot and began to unstrap. Colonel Fang's parting comments to the Addled Aviator stung his ears as C. R. arose and made his way to the relief facilities in the rear of the cargo compartment, coffee cup in hand. "If you mess this one up, Terror, I'll see to it you spend the rest of your natural life, however short it may be, picking grains of sand from cargo compartment floors of Hercs returning from the Middle East."

These very words echoed in his preoccupied brain as the Ambient Aeronaut slipped on something and came crashing to the floor of the cargo compartment, filling the air with coffee. "Yeeooww," he shrieked, coffee cup still clutched in his now-scaulded hand. "What was that?"

There, at his feet, lay the object of his demise. Now stained with coffee and half out of its envelope, a letter addressed to Lt. Col. Ziggman, had fallen from one of the mail bags. The Great One's first reaction was to stuff the letter back in the envelope and return both to their proper location. However, as he picked up the tattered parcel, a small color photo dropped out. There, before



his eyes, was the most adorable young woman the Cynical Celebrant had ever seen. Not quite woman, but no longer child, the picture stirred C. R.'s curiousity to the point where he had to know more about her. So, despite his better judgment which, he admitted, had always been rather shaky, the Rhinestone Flyboy lifted himself to a troop seat and, by the dim cargo compartment lights, began to read . . .

"Dear Dad,

I miss you. I've been thinking a lot lately about where you are and what you're doing and I'm scared. I know a lot of it is my imagination, and you've told me many times that the chance of something happening to you is remote, but I still worry. As you know, kids' imaginations do that to them when situations like these come up. Above all, I want you to know how proud I am of you. I guess I'm pretty patriotic for my age, but I'm proud that you are there with other service men and women defending our freedom. I love America and I know you do too. I just wish I could do more to help. I know you're being as careful as you can so you can come home to us safe and sound. I will do my best to be good and take care of everyone here until you get back.

Love, Sarah

Tears welled in C. R.'s eyes as he carefully replaced the letter and picture and attempted to reseal the envelope. It would not seal, however, so he decided then and there he would hand-deliver this precious gift to the father of the young girl. He couldn't get the picture out of his mind as the Great One leaned back and drifted off to sleep.

"Major Terror." A voice from the distance echoed through his semiconsciousness and brought C.R. back to reality. "We're getting ready to start our descent for the airdrop," stammered Sergeant Downs, the loadmaster.

"Er, certainly, m'boy," mumbled the Drop Zone Demon. "Just so we have it straight, after we drop the two pallets of mail, we'll race-track around and give everyone the special surprise we talked about, right?"

"I don't know about this, boss. There really isn't a procedure for it. . . ."

"Tut, tut, m'lad. All will turn out splendidly."

With that, the Pompous Pilot and his Faithful Followers prepared for what was to follow. The drop was scheduled for one hour before sunrise with a west-to-east run-in for maximum effect. Although the weather was not quite up to standards with visibility down due to blowing sand, C. R. was determined to make the best of the opportunity at hand.

"I can't see squat at all," complained Sammy from the right seat.

"Neither can I," added Blinky from the right window.

"Not to worry," reassured the Maestro of MAC Machines, "there's a light up ahead . . . looks like the biscus gun on the point of impact."

However, as the crew drew nearer the ominously bright light in the east, their eyes filled with wonder to behold what appeared to be a star situated directly over a very distinctly marked drop zone.

"Point of impact in sight," blurted C. R., "green light."

The crew could not believe their eyes as they race-tracked around to witness the two pallets of mail drift gently to the surface and land precisely on the block letter marking the point of impact.

"Ready for the next pass, loadmaster," queried the Left-Seat Lothario?

"Ready when you are," came the reply from the rear.

To the amazement of all, the giant war machine accomplished the circular maneuver with flawless precision . . . almost. As C. R. rolled out over what he thought was the drop zone and shrieked, "GREEN LIGHT," Blinkey let out an ear-shattering "NO DROP," which went unheeded.

The air was filled with what, as the Master Manipulator had intended, appeared to be snow, as billions of particles of confetti drifted slowly earthward . . . *into a herd of camels* . . . sending the bewildered beasts scurrying in every direction as fast as their legs would carry them.

C. R. and his troops had no idea of the wide range of emotion running through the reception committee awaiting them as they deplaned. They were met by a host of enthusiastic troops . . . some ecstatic over the arrival of Christmas mail . . . some overcome by the breathtaking display of an unexpected "White Christmas" . . . and others rather irate over a camel stampede. In the end, however, all was forgiven that Christmas morning when the Addled Aviator handed a coffee-stained letter from a 13-year old angel on the other side of the world to a previously unsympathetic ALCE commander, one Lt. Col. Ziggman.

QUICKSTOPPERS

BLINDED BY THE LIGHT

The crew of this Heavy had been assigned 14,000 feet by departure control but, upon contact with Center, were told to level at 13,000 feet because of turbulance. Passing through 12,500, they found the turbuelence along with precipitation and St. Elmo's fire. The St. Elmo's fire was present on the windows and began to build up ahead of the radar dome. The pilots, having never seen the light show before, leaned forward to take a better look. While they both had their eyes focused out the window, the St. Elmo's fire discharged with a blinding flash. The resulting interruption in the crew's vision, combined with the still present turbulence, caused the plane to fly 500 feet above assigned altitude before recovery was possible.

Compliments of *436 MAW/SE*

WHOA SILVER, WHOA

Following a full stop landing at a municipal airport, the solo pilot of this Piper Warrior taxied to transient parking. Due to a lack of wingtip clearance, the pilot elected to shut down and hand-tow the aircraft into position. There were no chocks available, either in the airplane or in the immediate vicinity, so the pilot elected to release the parking brake and departed the cockpit to set up for the tow. While he was walking around the aircraft, after having removed the tow bar from the cargo compartment, the plane began to roll backward down a shallow incline. After traveling approximately 30 feet, with the pilot in hot pursuit, the plane departed the prepared parking surface and rolled into a drainage ditch where the left horizontal stabilizer impacted a pole. Sometimes best intentions just aren't enough to keep you out of trouble.

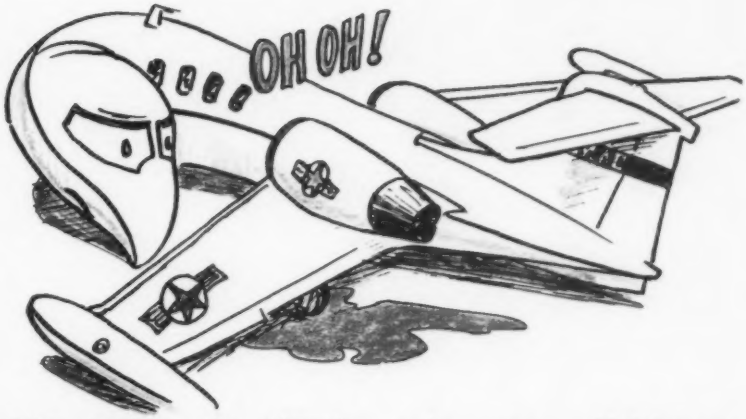
KEEP YOUR HAND TO YOURSELF

An MH-60G had been modified to carry additional fuel tanks which required a relocation of the hoist assembly. This resulted in an overlap between the now-moved hoist and the fast rope bar. On the surface, this modification did not appear to be hazardous, but "one broken hand" later, we know a flight engineer who could testify to the contrary.

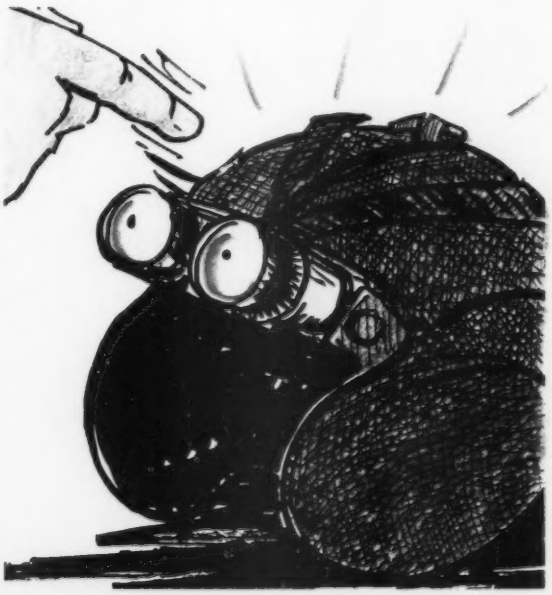
The mishap occurred during live hoist training in the third extraction. The first two hoists had gone well and the third attempt appeared to be following the same pattern. As the "survivor" neared the airframe, the FE brought the boom toward the aircraft, his right hand holding the hoist pendant and resting on top of the boom. Suddenly, the FE realized his hand was trapped between the boom and the fast rope bar and that he was unable to reach the control which would allow him to reverse the boom and free himself. He managed to get the copilot's attention who then reversed the boom. This released the FE but not before his hand was broken.

RELEASE WHAT?

During takeoff roll, the crew of this C-21 noticed their aircraft was slow to accelerate but at rotation seemed to "leap" into the air. While completing the "After Takeoff Checklist," the copilot found the parking brake handle still partially extended. Upon arrival, the crew lowered the landing gear but was unable to get the gear doors to close to their normal position. They decided to recycle the gear but did not check hydraulic pressure. When the gear handle was raised, both gear and doors failed to actuate. The crew then lowered the gear handle and noticed hydraulic pressure had dropped to zero. They turned on the auxiliary hydraulic pump and normal pressure was restored.



After landing, the Aircraft Commander applied light brakes and was notified by Tower that the aircraft was "smoking" on roll-out. Following a fire department inspection, the crew taxied to parking and discovered hydraulic fluid under and around the left main gear. Maintenance discovered both left brakes leaking severely and the right hydraulic pump damaged. The failure was attributed to the slightly extended parking brake that caused overheating and subsequent failure of the wheel brake system.



MY HELMET DID IT!

The HH-3E crew was participating in deck landing qualification training using AN/AVS-6 Night Vision Goggles (NVGs). After numerous uneventful landings, a crew change took place. The IP in the left seat had control of the aircraft while the right seat pilot swapped out. When the replacement pilot got into the seat, the wire from his NVG battery pack snagged and pulled the Number One Fire T-handle. This resulted in the IP performing the bold face procedures for a single engine failure. Fortunately, he was able to maintain altitude and turn toward shore. During checklist cleanup, the pulled T-handle was discovered and a successful engine restart accomplished. Investigation revealed the battery pack was installed on the mishap pilot's helmet with the wire from the pack on top, resulting in over an inch of exposed excess wire which snagged the fire handle. One technique is to secure the excess wire with tape.

After Deadlines

AERONAUTICAL SYSTEMS DIVISION (ASD) AWARDS CONTRACT--ASD awarded a $33 million contract to Boeing Advanced Systems, Co., Seattle, Wash., for 5,300 Protective Integrated Hood/Masks (PIHM) for aircrews supporting Operation Desert Shield. The PIHM were developed under the Aircrew Eye Respiratory Systems Division, Wright-Patterson AFB, Ohio., and will be used Air Force-wide to replace the MBU-13P chemical mask now worn by aircrews. Unlike the MBU-P13, it will be equipped with a blower unit, an intercom system, a C-2 air filter canister, and an oxygen mask and hood that fit under the pilot's helmet. According to Mr. Robert May, Director of the Human Protection Systems Division, "With the PIHM, there will be a minor modification to the aircraft, but a major upgrade to the pilot's ability to operate in a chemical environment." The PIHM will be used with the recently acquired new, lightweight chemical protection suits for use by air and ground crews. A $26.9 million contract was awarded in September to Hoechst Celanese Corp., Charlotte, N.C., for production of these lightweight suits, also to support Desert Shield.

LOCKHEED AIRLIFTERS OPERATING AT FULL SPEED--Operating at two to three times their normal peace time workload, Lockheed-built transport aircraft are performing their role as the foundation of the U.S. deployment to the Middle East. During the first two months of Operation Desert Shield, MAC has logged more than 145,000 flying hours in support of the operation, with about 85 percent of that time--more than 3,400 missions--flown by Lockheed C-5s and C-141s. "So far, the Military Airlift Command has moved more than one-quarter of a billion pounds of cargo in support of Operation Desert Shield," said General Hansford T. Johnson. "The vast majority has been moved on C-5, C-141, and C-130 aircraft. Lockheed can be proud of how superbly its aircraft have performed in the Middle East.".

CHANGES TO FLIPS--The following changes will be made on 13 Dec 1990: DOD Terminal Low-Low altitude military SIDs, and DOD Terminal High-High altitude military SIDs, currently published in loose-leaf, will be incorporated into the appropriate IAP volumes. DOD Selected Terminal Low-Publication will be discontinued. Civil SIDs/STARs--A new two-volume DOD set containing civil SIDs and STARs will be published. NOS will incorporate these same SIDs and STARs into their new 16-volume Terminal Procedures Publications. Questions may be directed to DMAAC/PRF, DSN 693-4961 or Commercial 314-273-4961.

DUE TO INCOMPLETE INFORMATION--We omitted the names of three Air Weather Service individuals who lost their lives along with the Kelly reserve crew aboard a Travis C-5. They were MSgt Samual M. Gardner, Jr., SSgt. Rande J. Hulec, and Mark H. Cleyman. We deeply regret the omission.

★ U.S. GOVERNMENT PRINTING OFFICE: 1990-554-015/40001

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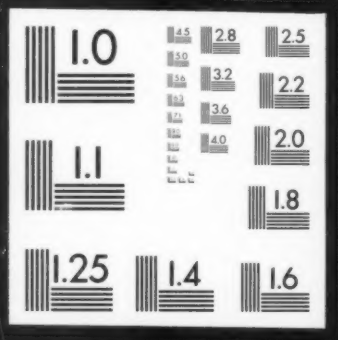
Fly Safe!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